Journal of Chemical Ecology

Volume 18, Number 1 **January 1992**

CONTENTS

Phytotoxicity of Sorgoleone Found in Grain Sorghum Root Exudates 1
FRANK A. EINHELLIG and ITAMAR F. SOUZA

Abraxas grossulariata L. (Lepidoptera: Geometridae): Identification of (3Z,6Z,9Z)-3,6,9-heptadecatriene and (6Z,9Z)-6,9-*cis*-3,4-epoxyheptadecadiene in the Female Sex Pheromone 13
M. TÓTH, H.R. BUSER, P.M. GUERIN, H. ARN, F. SCHMIDT, W. FRANCKE, and G. SZÖCS

Mandibular Gland Secretions of the Male Beewolves *Philanthus crabroniformis*, *P. barbatus*, and *P. pulcher* (Hymenoptera: Sphecidae) 27
C.A. MCDANIEL, J.O. SCHMIDT, and R.W. HOWARD

Allelopathic Effects of Water Extracts of *Artemisia princeps* var. *orientalis* on Selected Plant Species 39
BONG-SEOP KIL and KYEONG WON YUN

(Z)-10-Heptadecen-2-One and Other 2-Ketones in the Aggregation Pheromone Blend of *Drosophila martensis*, *D. buzzatii*, and *D. serido* 53
ANGELA M. SCHANER and LARRY L. JACKSON

Chemistry of Pheromonal and Defensive Secretions in the Nymphs and the Adults of *Dysdercus cingulatus* Fabr. (Heteroptera, Pyrrhocoridae) 65
J.P. FARINE, O. BONNARD, R. BROSSUT, and J.L. LE QUERE

Ultrastructural and Chemical Examination of Paper and Pedicel from Laboratory and Field Nests of the Social Wasp *Polistes metricus* Say 77
THERESA L. SINGER, KARL E. ESPELIE, and DAVID S. HIMMELSBACH

The Role of Chemosensory Cues in Discrimination of Prey Odors by the Amphisbaenian *Blanus cinereus* 87
PILAR LÓPEZ and ALFREDO SALVADOR

Journal of Chemical Ecology

Volume 18, Number 2 **February 1992**

CONTENTS

Replacement of Carcinogenic Alkylating Agent Ethylene Oxide in the Synthesis of (Z)-3-Dodecen-1-YL (*E*)-2-Butenoate, Sex Pheromone of Sweet-Potato Weevil, *Cylas formicarius elegantulus* (Summers) and *Cylas formicarius formicarius* (F.) 95
CHI-CHU LO, MING-DER HUNG, and CHENG-JIUNG LIU

Evaluation of Flavonoids in *Gossypium arboreum* (L.) Cottons as Potential Source of Resistance to Tobacco Budworm 105
PAUL A. HEDIN, JOHNIE N. JENKINS, and WILLIAM L. PARROTT

Enantiospecific Synthesis of (3*S*,6*R*)-3-Hydroxy-1,7-Dioxaspiro[5.5]Undecane and Its (4*R*)-4-Hydroxy Isomer [Minor Components of Olive Fruit Fly (*Dacus oleae*) Sex Pheromone] 115
ISIDORO IZQUIERDO CUBERO, MARIA T. PLAZA LÓPEZ-ESPINOSA, and RAFAEL ACUÑA CASTILLO

A Nematicidal Toxin from *Pleurotus ostreatus* NRRL 3526 127
O.C.H. KWOK, R. PLATTNER, D. WEISLEDER, and D. T. WICKLOW

Arrestment of Male Twospotted Spider Mite Caused by Female Sex Pheromone 137
REED N. ROYALTY, P. LARRY PHELAN, and FRANKLIN R. HALL

Possible Ecological Significance of Within-Fruit and Seed Furocoumarin Distribution in Two *Psoralea* Species 155
E.M. CAPPELLETTI, G. INNOCENTI, and G. CAPORALE

Sex Pheromone Components of the Giant Looper, *Boarmia selenaria* Schiff. (Lepidoptera: Geometridae): Identification, Synthesis, Electrophysiological Evaluation, and Behavioral Activity 165
A.A. COSSÉ, R. CYJON, I. MOORE, M. WYSOKI, and D. BECKER

Leaf-Cutting Ant *Atta laevigata* (Formicidae: Attini) Marks Its Territory with Colony-Specific Dufour Gland Secretion 183
A. SALZEMANN, P. NAGNAN, F. TELLIER, and K. JAFFE

Sorgoleone from Root Exudate Inhibits Mitochondrial Functions 197
JAMES A. RASMUSSEN, ANGELA M. HEJL, FRANK A. EINHELLIG, and JOHN A. THOMAS

Comparative Chemistry of Elaiosomes of Three Species of *Trillium* 209
JANET LANZA, MARLENE A. SCHMITT, and ATIF B. AWAD

Comparison of Volatiles Emitted by Male Caribbean and Mexican Fruit Flies 223
JAMES R. ROCCA, JAMES L. NATION, LUCJAN STREKOWSKI, and MERLE A. BATTISTE

Field Trapping of *Migdolus fryanus* Westwood (Coleoptera: Cerambycidae) Using Natural Sex Pheromone 245
JOSÉ MAURÍCIO S. BENTO, FRANCISCO EVANDRO ALBINO, TEREZINHA M.C. DELLA LUCIA, and EVALDO F. VILELA

Fate of [^{14}C]Xanthotoxin (8-Methoxypsoralen) in Laying Hens and a Lactating Goat 253
NORMA C. PANGILINAN, G. WAYNE IVIE, BERVELY A. CLEMENT, ROSS C. BEIER, and MICHAEL UWAYJAN

Journal of Chemical Ecology

Volume 18, Number 3 **March 1992**

CONTENTS

Weak Responses of Pine Sawfly Larvae to High Needle Flavonoid Concentrations in Scots Pine 271
STIG LARSSON, LENNART LUNDGREN, CLIFFORD P. OHMART, and ROLF GREF

Biological Activity and *in vivo* Degradation of Tritiated Female Sex Pheromone in the Male European Corn Borer 283
J.A. KLUN, M. SCHWARZ, and E.C. UEBEL

Filamentous Nature of Pheromone Plumes Protects Integrity of Signal from Background Chemical Noise in Cabbage Looper Moth, *Trichoplusia ni* 299
YONG-BIAO LIU and KENNETH F. HAYNES

Chemistry and Chemical Ecology of the Bahamian Sponge *Aplysilla glacialis* 309
STEVEN C. BOBZIN and D. JOHN FAULKNER

Electroantennogram Response of Alfalfa Seed Chalcid, *Bruchophagus roddi* (Hymenoptera: Eurytomidae) to Host- and Nonhost-Plant Volatiles 333
DOUGLAS M. LIGHT, JAMES A. KAMM, and RONALD G. BUTTERY

Biological Evidence of an Oviposition-Deterring Pheromone in *Lobesia botrana* Den. et Schiff. (Lepidoptera, Tortricidae) 353
BRUNO GABEL and DENIS THIÉRY

Major Antitermitic Components of the Heartwood of Southern Catalpa 359
C.A. MCDANIEL

Electroantennogram Responses of Synthetic Periplanone-A and Periplanone-B in the American Cockroach 371
H.T. YANG, C.H. WANG, R. KOU, and Y.S. CHOW

Male-Specific Tetraene and Triene Hydrocarbons of *Carpophilus hemipterus:* Structure and Pheromonal Activity 379
ROBERT J. BARTELT, DAVID WEISLEDER, PATRICK F. DOWD, and RONALD D. PLATTNER

Female Sex Pheromone of Oriental Tobacco Budworm, *Helicoverpa assulta* (Guenee) (Lepidoptera: Noctuidae): Identification and Field Testing 403
A. CORK, K.S. BOO, E. DUNKELBLUM, D.R. HALL, K. JEE-RAJUNGA, M. KEHAT, E. KONG JIE, K.C. PARK, P. TEPGIDAGARN, and LIU XUN

Identification and Synthesis of Insect Pheromone XXX. Sex Pheromone of Mulberry Clearwing Moth *Paradoxecia pieli* Lieu 419
TAN ZHONG-XIN, LIN GUO-QIANG, LIU HAN-QUAN, PU GUAN-QIN, DU HE-MING, MAO JIAN-PIN, MENG LIAN-ZHONG, and WU CAI-HONG

A Potential Kairomone Stimulates Pheromone-Responsive Receptor Neurons in *Utetheisa ornatrix* (Lepidoptera: Arctiidae) 427
FRANZ BOGNER, ALAN J. GRANT, and ROBERT J. O'CONNELL

Identification of Male Cabbage Looper Sex Pheromone Attractive to Females 441
R.R. HEATH, P.J. LANDOLT, B.D. DUEBEN, R.E. MURPHY, and R.E. SCHNEIDER

Elevation in Tongue-Flick Rate After Biting Prey in the Broad-Headed Skink, *Eumeces laticeps* 455
WILLIAM E. COOPER, JR.

Effect of DIMBOA, an Aphid Resistance Factor in Wheat, on the Aphid Predator Eriopis Connexa Germar (Coleoptera: Coccinellidae) 469
AGUSTIN MARTOS, ARTURO GIVOVICH, and HERMANN M. NIEMEYER

Effects of Colorado Potato Beetle and Potato Leafhopper on Amino Acid Profile of Potato Foliage 481
E.S. TOMLIN and M.K. SEARS

Defensive Secretion of a Carabid Beetle, *Helluomorphoides clairvillei* 489
A.B. ATTYGALLE, J. MEINWALD, and T. EISNER

Influence of Life History Differences of Two Tachinid Parasitoids of *Helicoverpa zea* (Boddie) (Lepidoptera: Noctuidae) on Their Interactions with Glandular Trichome/Methyl Ketone-Based Insect Resistance in Tomato 499
R.R. FARRAR, JR., G.G. KENNEDY, and R.K. KASHYAP

Identification of Trail Pheromone Precursors from Subterranean Termite, *Coptotermes formosanus* Shiraki (Isoptera: Rhinotermitidae) 517
MASAHIKO TOKORO, MUNEZOH TAKAHASHI, and RYOHEI YAMAOKA

ERRATUM 527

BOOK REVIEW
Chemical Signals in Vertebrates 5 529
D.W. MACDONALD, D. MÜLLER-SCHWARZE, and S.E. NATYNCZUK

Journal of Chemical Ecology

Volume 18, Number 4 **April 1992**

CONTENTS

Response of Mountain Pine Beetle (*Dendroctonus ponderosae*) to Lodgepole Pine Trees Baited with Verbenone and *exo*-Brevicomin 533
T.L. SHORE, L. SAFRANYIK, and B.S. LINDGREN

Technique for Using Microencapsulated Terpenes in Lepidopteran Artificial Diets 543
KAREN M. CLANCY, RICHARD D. FOUST, THOMAS G. HUNTSBERGER, JOHN G. WHITAKER, and DOUGLAS M. WHITAKER

Feeding Response of the Silkworm, *Bombyx mori*, to UV Irradiation of Mulberry Leaves 561
MITSUO YAZAWA, TOSHIAKI SHIMIZU, and TSUNEO HIRAO

Avoidance of Antinutritive Plant Defense: Role of Midgut pH in Colorado Potato Beetle 571
G.W. FELTON, J. WORKMAN, and S.S. DUFFEY

Computer Tracking as a Behavioral GC Detector: Nematode Responses to Vapor of Host Roots 585
MARK E. MCCALLUM and DAVID B. DUSENBERY

Meliaceae and Rutaceae Limonoids as Termite Antifeedants Evaluated Using *Reticulitermes speratus* Kolbe (Isoptera: Rhinotermitidae) 593
MUNEY SERIT, MUNETAKA ISHIDA, NOBUYUKI HAGIWARA, MUJO KIM, TAKEHIKO YAMAMOTO, and SHOZA TAKAHASHI

Influence of Different Habitats and Mating on Olfactory Behavior of Onion Flies Seeking Ovipositional Hosts 605
G.J.R. JUDD and J.H. BORDEN

Aggregated Oviposition in *Delia antiqua* (Meigen): A Case for Mediation by Semiochemicals 621
G.J.R. JUDD and J.H. BORDEN

Introduction of Methyl Groups to Acetate Substituted Chain of (*Z*)-5-Decenyl Acetate, A Pheromone Component of Turnip Moth, *Agrotis segetum*: Synthesis, Single-Sensillum Recordings, and Structure-Activity Relationships 637
STIG JÖNSSON, TOMMY LILJEFORS, and BILL S. HANSSON

Multivariate Study of Moose Browsing in Relation to Phenol Pattern in Pine Needles 659
KERSTIN SUNNERHEIM-SJÖBERG and MARKKU HÄMÄLÄINEN

6,10,14-Trimethylpentadecan-2-one: A Bermuda Grass Phagostimulant to Fall Armyworm (Lepidoptera: Noctuidae) 673
M.A. MOHAMED, S.S. QUISENBERRY, and D.J. MOELLENBECK

Journal of Chemical Ecology

Volume 18, Number 5 **May 1992**

CONTENTS

Allelopathy of Yellow Fieldcress (*Rorippa sylvestris*): Identification and Characterization of Phytotoxic Constituents 683
A. YAMANE, H. NISHIMURA, and J. MIZUTANI

Floral Volatiles of *Tanacetum vulgare* L. Attractive to *Lobesia botrana* Den. et Schiff. Females 693
BRUNO GABEL, DENIS THIÉRY, VACLAV SUCHY, FRÉDÉRIC MARION-POLL, PETER HRADSKY, and PAVEL FARKAS

Seasonal Variation of Lipids in Femoral Gland Secretions of Male Green Iguanas (*Iguana iguana*) 703
ALLISON C. ALBERTS, THOMAS R. SHARP, DAGMAR I. WERNER, and PAUL J. WELDON

Formononetin 7-*O*-Glucoside (Ononin), an Additional Growth Inhibitor in Soils Associated with the Weed, *Pluchea lanceolata* (DC) C.B. Clarke (Asteraceae) 713
INDERJIT and K.M.M. DAKSHINI

Tannic Acid Inhibition of Amino Acid and Sugar Absorption by Mouse and Vole Intestine: Tests Following Acute and Subchronic Exposure 719
WILLIAM H. KARASOV, MICHAEL W. MEYER, and BRUCE W. DARKEN

Activity of Perfluorobutyl-Containing Components in Pheromone Blend of Cabbage Looper Moth, *Trichoplusia ni* 737
CHARLES LINN, WENDELL ROELOFS, WEI-CHUAN SUN, and GLENN D. PRESTWICH

Diel Periodicity and Influence of Age and Mating on Sex Pheromone Titer in Gypsy Moth, *Lymantria dispar* (L.) 749
JULIET D. TANG, RALPH E. CHARLTON, RING T. CARDÉ, and CHIH-MING YIN

Effect of Kairomones from Egg and Female Adult Stages of *Ostrinia nubilalis* Hübner (Lepidoptera Pyralidae) on *Trichogramma brassicae* Bezdenko (Hymenoptera Trichogrammatidae) Female Kinesis 761
C. FRENOY, C. DURIER, and N. HAWLITZKY

Studies on *Paecilmyces marquandii* from Nematode Suppressive Chinampa Soils 775
NAHUM MARBAN-MENDOZA, ROBERTO GARCIA-E., M. BESS DICKLOW, and BERT M. ZUCKERMAN

Discriminant Analysis of Cuticular Hydrocarbons of Social Wasp *Polistes exclamans* Viereck and Surface Hydrocarbons of Its Nest Paper and Pedicel 785
THERESA L. SINGER, MICHAEL A. CAMANN, and KARL E. ESPELIE

D-(+)-Pinitol, an Oviposition Stimulant for the Pipevine Swallowtail Butterfly, *Battus philenor* 799
DANIEL R. PAPAJ, PAUL FEENY, KUSUM SACHDEV-GUPTA, and LORRAINE ROSENBERRY

Journal of Chemical Ecology

Volume 18, Number 6 **June 1992**

CONTENTS

Fate of Iridoid Glycosides in Different Life Stages of the Buckeye, *Junonia coenia* (Lepidoptera: Nymphalidae) 817
M. DEANE BOWERS and SHARON K. COLLINGE

Investigation of Sex Pheromone Components of Female Asian Corn Borer, *Ostrinia furnacalis* (Hübner) (Lepidoptera: Pyralidae) in Taiwan 833
R. KOU, H.Y. HO, H.T. YANG, Y.S. CHOW, and H.J. WU

Hydroxamic Acid Glucosides in Honeydew of Aphids Feeding on Wheat 841
A. GIVOVICH, S. MORSE, H. CERDA, H.M. NIEMEYER, S.D. WRATTEN, and P.J. EDWARDS

Phenylalkenals in Ponerine (*Leptogenys* sp.) and Myrmicine (*Pogonomyrmex* sp.) Ants 847
HENRY M. FALES, TAPPEY H. JONES, TAYSIR JAOUNI, MURRAY S. BLUM, and JUSTIN O. SCHMIDT

Calling Behavior and Pheromone Titer in the Smaller Tea Tortrix Moth, *Adoxophyes* sp. (Lepidoptera: Tortricidae) 855
RONG KOU

Response of Flea Beetles, *Phyllotreta* spp., to Mustard Oils and Nitriles in Field Trapping Experiments 863
KENNETH A. PIVNICK, ROBERT J. LAMB, and DARWIN REED

Evidence of an Aggregation Pheromone in the Flea Beetle, *Phyllotreta cruciferae* (Goeze) (Coleoptera: Chrysomelidae) 875
CHENGWANG PENG and MICHAEL J. WEISS

Feeding Stimulatory and Inhibitory Chemicals from an Acceptable Nonhost Plant for *Manduca sexta*: Improved Detection by Larvae Deprived of Selected Chemosensory Organs 885
GERRIT DE BOER, ANNEGRET SCHMITT, ROBIN ZAVOD, and LESTER A. MITSCHER

Phenylacetic Acid as a Phytotoxic Compound of Corn Pollen 897
A.L. ANAYA, B.E. HERNANDEZ-BAUTISTA, M. JIMENEZ-ESTRADA, and L. VELASCO-IBARRA

Attraction of *Heliothis virescens* (F.) (Lepidoptera: Noctuidae) to Volatiles from Extracts of Cotton Flowers 907
F.C. TINGLE and E.R. MITCHELL

Do Defoliation and Subsequent Phytochemical Responses Reduce Future Herbivory on Oak Trees? 915
STANLEY H. FAETH

BOOK REVIEWS
Insect Chemical Ecology by Ivan Hrdý (ed.) 927
J.A.A. RENWICK

Herbivores: Their Interactions with Secondary Plant Metabolites—Volume 1. The Chemical Participants by G.A. Rosenthal and M.R. Berenbaum (eds.) 929
MICHAEL M. MARTIN

Journal of Chemical Ecology

Volume 18, Number 7 **July 1992**

CONTENTS

6-Methoxy-2-Benzoxazolinone: A Semiochemical for Host Location by Western Corn Rootworm Larvae 931
LOUIS B. BJOSTAD and BRUCE E. HIBBARD

Behavioral Responses of Western Corn Rootworm Larvae to Naturally Occurring and Synthetic Hydroxamic Acids 945
YONGSHOU XIE, J. THOR ARNASON, BERNARD J.R. PHILOGÈNE, JEFFREY ATKINSON, and PETER MORAND

Chemical Mediation of Behavior in Hermit Crabs: Alarm and Aggregation Cues 959
D. RITTSCHOF, D.W. TSAI, P.G. MASSEY, L. BLANCO, G.L. KUEBER, JR., and R.J. HAAS, JR.

Chemical Variation Within and Between Individuals of *Plantago lanceolata* (Plantaginaceae) 985
M. DEANE BOWERS and NANCY E. STAMP

Accumulation of the Phytoalexin, Glyceollin, in Root Nodules of Soybean Formed by Effective and Ineffective Strains of *Bradyrhizobium japonicum* 997
D.B. KARR, D.W. EMERICH, and A.L. KARR

Influence of Cabbage Proteinase Inhibitors *In situ* on the Growth of Larval *Trichoplusia ni* and *Pieris rapae* 1009
ROXANNE M. BROADWAY and ANTIA A. COLVIN

Effects of Some Compounds Isolated from *Celaenodendron mexicanum* Standl (Euphorbiaceae) on Seeds and Phytopathogenic Fungi 1025
P. CASTAÑEDA, M.R. GARCIA, B.E. HERNANDEZ, B.A. TORRES, A.L. ANAYA, and R. MATA

An Investigation of Human Apocrine Gland Secretion for Axillary Odor Precursors 1039
XIAO-NONG ZENG, JAMES J. LEYDEN, JOSEPH G. BRAND, ANDREW I. SPIELMAN, KENNETH J. MCGINLEY, and GEORGE PRETI

Sex Pheromone Components of the Geometrid Moths *Lobophora nivigerata* and *Epirrhoe sperryi* 1057
J.G. MILLAR, M. GIBLIN, D. BARTON, and E.W. UNDERHILL

Role of the Isoflavonoid Coumestrol in the Constitutive Antixenosic Properties of "Davis" Soybeans Against an Oligophagous Insect, the Mexican Bean Beetle 1069
B.J. BURDEN and D.M. NORRIS

Effects of Some Natural Volatile Compounds on the Pathogenic Fungi *Alternaria alternata* and *Botrytis cinerea* 1083
T.R. HAMILTON-KEMP, C.T. MCCRACKEN, JR., J.H. LOUGHRIN, R.A. ANDERSEN, and D.F. HILDEBRAND

Sex Attractants for the White-Barred Groundling Moth (*Recurvaria leucatella* Clerck) and the Lesser Bud Moth (*R. nanella* Hübner) (Lepidoptera: Gelechiidae) 1093
MIKLÓS TÓTH and ROBERT E. DOOLITTLE

Parasitic *Meloidogyne* and Mutualistic *Acremonium* Increase Chitinase in Tall Fescue 1107
C.A. ROBERTS, S.M. MAREK, T.L. NIBLACK, and A.L. KARR

Attraction of Male Beetles to Grubs: Evidence for Evolution of a Sex Pheromone from Larval Odor 1117
K.F. HAYNES, D.A. POTTER, and J.T. COLLINS

Furanocoumarin Content and Phototoxicity of Rough Lemon (*Citrus jambhiri*) Foliage Exposed to Enhanced Ultraviolet-B (UVB) Irradiation 1125
ERIC S. MCCLOUD, MAY BERENBAUM, and ROBERT W. TUVESON

Possible Function of Ecdysteroid-22-*O*-Acyltransferase in the Larval Gut of Tobacco Budworm, *Heliothis virescens* 1139
MINLI ZHANG and ISAO KUBO

Influence of the Plant Antifeedant, Pinosylvin, on Suppression of Feeding by Snowshoe Hares 1151
THOMAS P. SULLIVAN, DOUGLAS R. CRUMP, HAL WEISER, and ELISABETH A. DIXON

Evidence for the Accessory Glands as the Site of Production of the Oviposition Attractant and/or Stimulant of *Lutzomyia longipalpis* (Diptera: Psychodidae) 1165
MARTIN J. DOUGHERTY, RICHARD D. WARD, and GORDON HAMILTON

Species-Specific, Two-Component, Volatile Signals in Two Sympatric Ant-Lion Species: *Synclysis baetica* and *Acanthaclisis occitanica* (Neuroptera, Myrmeleontidae) 1177
G. BERGSTRÖM, A.-B. WASSGREN, H.-E. HÖGBERG, E. HEDENSTRÖM, A. HEFETZ, D. SIMON, T. OHLSSON, and J. LÖFQVIST

Resistance of Cereals to Aphids: The Interaction between Hydroxamic Acids and UDP-Glucose Transferases in the Aphid *Sitobion avenae* (Homoptera: Aphididae) 1189
B. LESZCZYNSKI, H. MATOK, and A.F.G. DIXON

Dendroctonus pseudotsugae Hopkins (Coleoptera: Scolytidae): Production of and Response to Enantiomers of 1-Methylcyclohex-2-en-1-ol 1201
B.S. LINDGREN, G. GRIES, H.D. PIERCE, JR., and K. MORI

Development and Evaluation of Systems to Collect Volatile Semiochemicals from Insects and Plants Using a Charcoal-Infused Medium for Air Purification 1209
R.R. HEATH and A. MANUKIAN

Odors Influence Choice of Oviposition Sites by *Diabrotica virgifera virgifera* (Coleoptera: Chrysomelidae) 1227
D.R. LANCE

A Four-Component Attractant for the Mexican Fruit Fly, *Anastrepha ludens* (Diptera: Tephritidae), from Host Fruit 1239
D.C. ROBACKER, W.C. WARFIELD, and R.A. FLATH

Qualitative and Quantitative Analysis of Volatiles and Pheromone Gland Extracts Collected from *Galleria mellonella* (L.) (Lepidoptera: pyralidae) 1255
KAREN E. ROMEL, CYNTHIA D. SCOTT-DUPREE, and MARGARET H. CARTER

Attraction of Female Fathead Minnows, *Pimephales promelas*, to Chemical Stimuli from Breeding Males 1269
KATHLEEN S. COLE and R.J.F. SMITH

BOOK REVIEW
Ecological Chemistry and Biochemistry of Plant Terpenoids 1285
BERNARD J.R. PHILOGÈNE

Journal of Chemical Ecology

Volume 18, Number 8 **August 1992**

CONTENTS

Inhibition of Growth of *Phytophthora parasitica* var. *nicotianae* by Aromatic Acids and Coumarins in Laboratory Bioassay 1287
MAURICE E. SNOOK, ALEXANDER S. CSINOS, and ORESTES T. CHORTYK

Host Marking Pheromone of *Rhagoletis cerasi*: Foraging Behavior in Response to Synthetic Pheromonal Isomers 1299
MARTIN ALUJA and ERNST F. BOLLER

Laboratory Colonization has not Reduced Constitutive or Induced Polysubstrate Monooxygenase Activity in Velvetbean Caterpillars 1313
G.S. WHEELER, F. SLANSKY, JR., and S.J. YU

Intra- and Interspecific Sex Pheromone Responses of Screwworm and Secondary Screwworm Flies 1327
L. HAMMACK

Attraction of Male Turnip Moths *Agrotis segetum* (Lepidoptera: Noctuidae) to Sex Pheromone Components and Their Mixtures at 11 Sites in Europe, Asia, and Africa 1337
MIKLÓS TÓTH, CHRISTER LÖFSTEDT, BARRY W. BLAIR, TOMÀS CABELLO, ALI I. FARAG, BILL S. HANSSON, BORIS G. KOVALEV, STEFANO MAINI, EVGENI A. NESTEROV, ISTVÀN PAJOR, ALEKSANDR P. SAZONOV, IGOR V. SHAMSHEV, MITKO SUBCHEV, and GÀBOR SZÖCS

Comparison of Anacardic Acid Biosynthetic Capability between Insect-Resistant and -Susceptible Geraniums 1349
D. HESK, R. CRAIG, and R.O. MUMMA

Chestnut Bark Tannin Assays and Growth of Chestnut Blight Fungus on Extracted Tannin 1365
SANDRA L. ANAGNOSTAKIS

Genetic Component of Variation in Chemical Defense of *Oreina gloriosa* (Chrysomelidae: Coleoptera) 1375
F. EGGENBERGER and M. ROWELL-RAHIER

(*E*)- and (Z)-6-Nonen-2-One: Biosynthetic Precursors of *endo*- and *exo*-Brevicomin in Two Bark Beetles (Coleoptera: Scolytidae) 1389
DÉSIRÉE VANDERWEL, GERHARD GRIES, S. MOHAN SINGH, JOHN H. BORDEN, and A. CAMERON OEHLSCHLAGER

Ontogenic Variation of Biologically Active Metabolites of *Pteridium aquilinum* (L. Kuhn), Pterosins A and B, and Ptaquiloside in a Bracken Population of the Tropical Andes 1405
MIGUEL E. ALONSO-AMELOT, MARGARITA PÉREZ-MENA, MARÍA P. CALCAGNO, RAMÓN JAIMES-ESPINOZA, and UVIDELIO CASTILLO

Chemical Composition of Sex Pheromone of Oriental Fruit Moth and Rates of Release by Individual Female Moths 1421
M.J. LACEY and C.J. SANDERS

Reassessment of Interaction between Gut Detergents and Tannins in Lepidoptera and Significance for Gypsy Moth Larvae 1437
E.J. IAN DE VEAU and JACK C. SCHULTZ

Influence of *Artemisia princeps* var. *orientalis* Components on Callus Induction and Growth 1455
BONG-SEOP KIL, KYEONG WON YUN, and SEUNG-YEOB LEE

BOOK REVIEW
Plant Kairomones in Insect Ecology and Control by Robert L. Metcalf and Ester R. Metcalf 1463
RONALD J. PROKOPY

Journal of Chemical Ecology

Volume 18, Number 9 **September 1992**

CONTENTS

Leaf Surface Chemicals from *Nicotiana* Affecting Germination of *Peronospora tabacina* (ADAM) Sporangia 1467
B.S. KENNEDY, M.T. NIELSEN, R.F. SEVERSON, V.A. SISSON, M.K. STEPHENSON, and D.M. JACKSON

Trends in Chemical Ecology Revealed with a Personal Computer Program for Searching Databases of Scientific References and Abstracts 1481
JOHN A. BYERS

Influence of Monoterpene Vapors on Spruce Spider Mite, *Oligonychus ununguis*, Adult Females 1497
STEPHEN P. COOK

Chemical Defense of *Populus balsamifera:* A Clarification 1505
THOMAS P. CLAUSEN, PAUL B. REICHARDT, JOHN P. BRYANT, and A.R.E. SINCLAIR

Lipid Components in the Anal Scent Sacs of Three Mongoose Species (*Helogale parvula, Crossarchus obscurus, Suricata suricatta*) 1511
DENISE M. DECKER, DAVID RINGELBERG, and DAVID C. WHITE

Effects of Salicylic Acid on Growth and Stomatal Movements of *Vicia faba* L.: Evidence for Salicylic Acid Metabolization 1525
BARBARA MANTHE, MARGOT SCHULZ, and HEIDE SCHNABL

Effect of Temperature and Sucrose Concentration on Hydroquinone Toxicity in Leafy Spurge Suspension Culture Cells 1541
MARY ELLEN HOGAN and GARY D. MANNERS

Pheromonal Transmission of an Aversive Experience in Domestic Pig 1551
CAROLINE VIEUILLE-THOMAS and J.P. SIGNORET

Effectiveness of Cardenolides as Feeding Deterrents to *Peromyscus* Mice 1559
JOHN I. GLENDINNING

(*S*)-(+)-Ipsdienol: Interspecific Inhibition of *Ips latidens* (Leconte) by *Ips pini* (Say) (Coleoptera: Scolytidae) 1577
DANIEL R. MILLER and JOHN H. BORDEN

Olfactory Recognition of Nonhosts Aspen and Birch by Conifer Bark Beetles *Tomicus piniperda* and *Hylurgops palliatus* 1583
L.M. SCHROEDER

An Equilibrium and Stability Study of Δ^1-Pyrroline 1595
JOHN D. BAKER, ROBERT R. HEATH, and JOCELYN G. MILLAR

Optimal Fractionation and Bioassay Plans for Isolation of Synergistic Chemicals: The Subtractive-Combination Method 1603
JOHN A. BYERS

Comparison of Volatiles from Beetle-Transmitted *Ceratocystis fagacearum* and Four Non-Insect-Dependent Fungi 1623
HENGCHEN LIN and P. LARRY PHELAN

Honeybee Nestmate Recognition: Effects of Queen Fecal Pheromones 1633
M.D. BREED, T.M. STILLER, M.S. BLUM, and R.E. PAGE JR.

Electroantennogram Responses of the Cabbage Seed Weevil, *Ceutorhynchus assimilis*, to Oilseed Rape, *Brassica napus* ssp. *oleifera*, Volatiles 1641
K.A. EVANS and L.J. ALLEN-WILLIAMS

Magnolia virginiana Neolignan Compounds as Chemical Barriers to Swallowtail Butterfly Host Use 1661
JAMES K. NITAO, KELLY S. JOHNSON, J. MARK SCRIBER, and MURALEEDHARAN G. NAIR

Journal of Chemical Ecology

Volume 18, Number 10 **October 1992**

CONTENTS

Chemistry of Defensive Secretions in Nymphs and Adults of Fire Bug, *Pyrrhocoris apterus* L. (Heteroptera, Pyrrhocoridae) 1673
J.P. FARINE, O. BONNARD, R. BROSSUT, and J.L. LE QUERE

Soil Transformation of 2(3H)-Benzoxazolone of Rye into Phytotoxic 2-Amino-3H-Phenoxazin-3-One 1683
RONALD W. GAGLIARDO and WILLIAM SCOTT CHILTON

Field Response of Predator *Rhizophagus grandis* to Prey Frass and Synthetic Attractants 1693
D. WAINHOUSE, P.A. BEECH-GARWOOD, R.S. HOWELL, D. KELLY, and M.P. OROZCO

Field Response of the Pine Sawfly *Neodiprion sertifer* to Controlled Release of Diprionyl Acetate, Diprionyl Propionate, and *trans*-Perillenal 1707
OLLE ANDERBRANT, MARIE BENGTSSON, JAN LÖFQVIST, and PETER BAECKSTRÖM

Efrapeptin Production by *Tolypocladium* Fungi (Deuteromycotina: Hyphomycetes): Intra- and Interspecific Variation 1727
STUART B. KRASNOFF and SANDEEP GUPTA

Orientation of *Microplitis croceipes* (Hymenoptera: Braconidae) to Green Leaf Volatiles: Dose–Response Curves 1743
D.W. WHITMAN and F.J. ELLER

Inhibitory Effects of Terpene Alcohols and Aldehydes on the Growth of Green Alga *Chlorella pyrenoidosa* 1755
MIYOSHI IKAWA, STEPHEN P. MOSLEY, and LINDA J. BARBERO

Antennal Olfactory Responsiveness of *Microplitis croceipes* (Hymenoptera: Braconidae) to Cotton Plant Volatiles 1761
YONGSHENG LI, JOSEPH C. DICKENS, and WILLIAM W.M. STEINER

Naive Ophiophagus Lizards Recognize and Avoid Venomous Snakes Using Chemical Cues 1775
JOHN A. PHILLIPS and ALLISON C. ALBERTS

Allelopathy of *Sasa cernua* 1785
HAI-HANG LI, HIROYUKI NISHIMURA, KOJI HASEGAWA, and JUNYA MIZUTANI

Responsiveness of *Pseudaletia unipuncta* (Lepidoptera: Noctuidae) Males, Maintained as Adults under Different Temperature and Photoperiodic Conditions, to Female Sex Pheromone 1797
STÉPHANE DUMONT and JEREMY N. MCNEIL

Antimicrobial Terpenes from Oleoresin of Ponderosa Pine Tree *Pinus ponderosa:* A Defense Mechanism Against Microbial Invasion 1809
MASAKI HIMEJIMA, KENNETH R. HOBSON, TOSHIKAZU OTSUKA, DAVID L. WOOD, and ISAO KUBO

A New Method for Fast Isolation of Insect Antifeedant Compounds from Complex Mixtures 1819
PIERRE ESCOUBAS, YUKIHARU FUKUSHI, LABUNMI LAJIDE, and JUNYA MIZUTANI

Allelochemicals from *Polygonum sachalinense* Fr. Schm. (Polygonaceae) 1833
M. INOUE, H. NISHIMURA, H.-H. LI, and J. MIZUTANI

Role of Plant Odor in Parasitism of European Corn Borer by Braconid Specialist Parasitoid *Macrocentrus grandii* Goidanich: Isolation and Characterization of Plant Synomones Eliciting Parasitoid Flight Response 1841
SUJAYA UDAYAGIRI and RICHARD L. JONES

Inhibition of Scots Pine Seedling Establishment by *Empetrum hermaphroditum* 1857
MARIE-CHARLOTTE NILSSON and OLLE ZACKRISSON

Evolution of a Crustacean Chemical Communication Channel: Behavioral and Ecological Genetic Evidence for a Habitat-Modified, Race-Specific Pheromone 1871
MICHAEL J. STANHOPE, MAUREEN M. CONNELLY, and BRIAN HARTWICK

ERRATUM 1889

Journal of Chemical Ecology

Volume 18, Number 11 **November 1992**

CONTENTS

Inhibition of Oxygen Evolution by Zaluzanin C 1891
B. LOTINA-HENNSEN, E. BERNAL-MORALES, A. ROMO DE VIVAR, A.L. PEREZ-C., A. CASTRO-R., AND M. AGUILAR-MARTINEZ

Multicomponent Sex Pheromone in *Macrocentrus grandii* Goidanich (Hymenoptera: Braconidae) 1901
PAUL D. SWEDENBORG AND RICHARD L. JONES

(*Z*)-4-Tridecenal, a Pheromonally Active Air Oxidation Product from a Series of (*Z*, *Z*)-9,13 Dienes in *Macrocentrus grandii* Goidanich (Hymenoptera: Braconidae) 1913
PAUL D. SWEDENBORG AND RICHARD L. JONES

Assessment of Allelopathic Potential in *Artemisia princeps* var. *orientalis* Residues 1933
KYEONG WON YUN AND BONG-SEOP KIL

Isothiocyanates as Alleopathic Compounds from *Rorippa indica* Hiern. (Cruciferae) Roots 1941
A. YAMANE, J. FUJIKURA, H. OGAWA, AND J. MIZUTANI

Detrimental Effects of *Cinchona* Leaf Alkaloids on Larvae of the Polyphagous Insect *Spodoptera exigua* 1955
ROB. J. AERTS, ANDRIES STOKER, MAARTEN BEISHUIZEN, INEKE JAARSMA, MIEKE VAN DE HEUVEL, EDDY VAN DER MEIJDEN, AND ROB VERPOORTE

Foliar Chemicals of Wheat and Related Grasses Influencing Oviposition by Hessian Fly, *Mayetiola destructor* (Say) (Diptera: Cecidomyiidae) 1965
S.P. FOSTER AND M.O. HARRIS

Effect of Ferulic Acid on Growth and Hydrolytic Enzyme Activities of Germinating Maize Seeds 1981
S. RAMA DEVI AND M.N.V. PRASAD

Defensive Role of *Allium* Sulfur Compounds for Leek Moth *Acrolepiopsis assectella* Z. (Lepidoptera) Against Generalist Predators 1991
BEHROUZ NOWBAHARI AND ERIC THIBOUT

Sex Pheromones of Male Yellowfin Baikal Sculpin (*Cottocomephorus grewingki*): Isolation and Chemical Studies 2003
PAVEL L. KASTEL, TAMARA M. DMITRIEVA, RASHID B. VALEYEV, AND YURI P. KOZLOV

Differences Among Sibling Species *Rhagoletis mendax* and *R. pomonella* (Diptera: Tephritidae) in their Antennal Sensitivity to Host Fruit Compounds 2011
J.E. FRY, T.J. BIERBAUM, AND G.L. BUSH

(1*S*,2*R*,4*S*,5*S*)-Angelicoidenol-2-*O*-β-D-Glucophyranoside—A Moose Deterrent Compound in Scots Pine (*Pinus sylvestris* L.) 2025
KERSTIN SUNNERHEIM-SJÖBERG

Semiochemical Basis of Infestation of Honey Bee Brood by *Varroa jacobsoni* 2041
JEROME TROUILLER, GERARD ARNOLD, BERTRAND CHAPPE, YVES LE CONTE, AND CLAUDINE MASSON

Defensive Secretion of First-Instar Larvae of Rootstalk Borer Weevil, *Diaprepes abbreviatus* L. (Coleoptera: Curculionidae), to the Fire-Ant *Solenopsis geminata* (F.) (Hymenoptera: Formicidae) 2055
C. PAVIS, C. MALOSSE, P.H. DUCROT, F. HOWSE, K. JAFFE, AND C. DESCOINS

Behavioral Responses to Own and Other Species' Scent Marks in *Lemur Fulvus* and *Lemur macaco* 2069
ISABELLE FORNASIERI AND JEAN-JACQUES ROEDER

Diversity in Steroidogenesis of Symbiotic Microorganisms from Planthoppers 2083
JOHN M. WETZEL, MAYUMI OHINISHI, TSUYOSHI FUJITA, KOJI NAKANISHI, YOKO NAYA, HIROAKI NODA, AND MIYOJI SUGIURA

Inhibition of *Schizachyrium scoparium* (Poaceae) by the Allelochemical Hydrocinnamic Acid 2095
G. BRUCE WILLIAMSON, ELIZABETH M. OBEE, AND JEFFREY D. WEIDENHAMER

Amino Acid Profiles and Liposomes: Their Role as Chemosensory Information Carriers in the Marine Environment 2107
J. DUDLEY WILLIAMS, KIM N. HOLLAND, DAVID M. JAMESON, AND REIMAR C. BRUENING

Metabolism and Exudation of Canavanine During Development of Alfalfa (*Medicago sativa* L. cv. Verko) 2117
J. MIERSCH, C. JÜHLKE, G. STERNKOPF, AND G.-J. KRAUSS

Disruption of Foraging by Argentine Ants, *Iridomyrmex humilis* (Mayr) (Hymenoptera: Formicidae), in Citrus Trees Through the Use of Semiochemicals and Related Chemicals 2131
HARRY H. SHOREY, LYLE K. GASTON, ROLAND G. GERBER, PHIL A. PHILLIPS, AND DAVID L. WOOD

BOOK REVIEWS

Chemical Communication: The Language of Pheromones 2143
DIETLAND MÜLLER-SCHWARZE

Microbial Mediation of Plant-Herbivore Interactions 2147
MARCEL DICKE

Announcement 2151

Journal of Chemical Ecology

Volume 18, Number 12 **December 1992**

CONTENTS

Capture of Gypsy Moth, *Lymantria dispar* (L.), and Lymantria Mathura (L.) Males in Traps Baited with Disparlure Enantiomers and Olefin Precursor in the People's Republic of China 2153
THOMAS M. ODELL, CHONG-HUA XU, PAUL W. SCHAEFER, BARBARA A. LEONHARDT, DE-FU YAO, AND XIANG-DE WU

Contents of Poison Apparatus and Their Relation to Trail-Following in the Ant *Daceton armigerum* 2161
E. DAVID MORGAN, BERT HÖLLDOBLER, TOMAS VAISAR, AND BRIAN D. JACKSON

Chemistry of Fruit Flies: Glandular Secretion of *Bactrocera* (Polistomimetes) *visenda* (Hardy) 2169
SABINE KROHN, MARY T. FLETCHER, WILLIAM KITCHING, CHRISTOPHER J. MOORE, RICHARD A.I. DREW, AND WITTKO FRANCKE

Performance Characteristics of a Commercial Controlled-Release Dispenser of Sex Pheromone for Control of Codling Moth (Cydia Pomonella) by Mating Disruption 2177
L.M. MCDONOUGH, W.C. ALLER, AND A.L. KNIGHT

Allelopathic Activity in Wheat-Conventional and Wheat-No-Till Soils: Development of Soil Extract Bioassays 2191
UDO BLUM, T.M. GERIG, A.D. WORSHAM, L.D. HOLAPPA, AND L.D. KING

Use of Odor Baits in Traps to Test Reactions to Intra- and Interspecific Chemical Cues in House Mice Living in Outdoor Enclosures 2223
LEE C. DRICKAMER, DAVID G. MIKESIC, AND KIMBERLY S. SHAFFER

Odors as Cues for Orientation to Mothers by Weanling Virginia Opossums 2251
DONNA J. HOLMES

2-Methylthiazolidine and 4-Ethylguaiacol, Male Sex Pheromone Components of the Cockroach *Nauphoeta cinera* (Dictyoptera, Blaberidae): A Reinvestigation 2261
DANIEL SIRUGUE, ODILE BONNARD, JEAN-LUC LE QUERE, JEAN-PIERRE FARINE, AND RÉMY BROSSUT

Chemical Cues Associated with Visually Elaborate Aggressive Displays of Three-Spine Stickleback Displays 2277
JOSEPH R. WAAS AND PATRICK W. COLGAN

Allelopathic Substances and Interactions of *Delonix Regia* (Boj.) Raf 2285
CHANG-HUNG CHOU AND LIH-LING LEU

Role of Lanierone in Chemical Ecology of *Ips pini* (Coleoptera: Scolytidae) in California 2305
STEVEN J. SEYBOLD, STEPHEN A. TEALE, DAVID L. WOOD, AIJUN ZHANG, FRANCIS X. WEBSTER, KENNETH Q. LINDAHL, JR., AND ISAO KUBO

Behavioral and Electrophysiological Activity of (*Z,E*)-7,9,11-Dodecatrienyl Formate, A Mimic of the Major Sex Pheromone Component of Carob Moth, *Ectomyelois ceratoniae* 2331
J.L. TODD, J.G. MILLAR, R.S. VETTER, AND T.C. BAKER

Oviposition Preference of the Diamondback Moth (*Plutella xylostella*) Unaffected by the Presence of Conspecific Eggs or *Bacillus Thuringiensis* 2353
FRANCIS R. GROETERS, BRUCE E. TABASHNIK, NAOMI FINSON, AND MARSHALL W. JOHNSON

Chemical Sex Discrimination in the Crayfish *Procambarus clarkii*: Role of Antennules 2363
JIN W. OH AND DAVID W. DUNHAM

Role of Sex Pheromone Components in Behavioral Reproductive Isolation Between *Autographa Gamma* (L.) and Either *Trichoplusia ni* (Hübner) or *Chrysodeixis chalcites* (Esp.) (Lepidoptera: Noctuidae: Plusinae) 2373
MICHAL MAZOR AND EZRA DUNKELBLUM

Attraction of Bark Beetles, *Tomicus piniperda, Hylurgops palliatus*, and *Trypodendron domesticum* and Other Insects to Short-Chain Alcohols and Monoterpenes 2385
JOHN A. BYERS

Book Reviews 2403

Author Index to Volume 18 2405

Key Word Index to Volume 18 2413